

What is claimed is:

1. A home network system, comprising:
  - a network based on a predetermined protocol;
  - 5 at least one electric device connected to the network; and
  - a network manager connected to the network, for controlling and/or monitoring the electric device,
  - wherein the protocol comprises an application layer, a network layer, a data link layer and a physical layer,
  - 10 wherein the physical layer further comprises a special protocol for providing an interface with a dependent transmission medium, and the network layer further comprises a home code control sub-layer for managing a home code for network security when accessing the dependent transmission medium; and
  - wherein an application layer protocol data unit (APDU) is transmitted
  - 15 between the application layer and the network layer, a network layer protocol data unit (NPDU) is transmitted between the network layer and the data link layer and between the network layer and the home code control sub-layer, a home code control sub-layer protocol data unit (HCNPDU) is transmitted between the home code control sub-layer and the data link layer, and a data frame unit is transmitted
  - 20 between the data link layer and the physical layer.
2. The system of claim 1, wherein the APDU comprises an APDU header and a protocol data unit (PDU).
- 25 3. The system of claim 2, wherein the PDU is a message transmitted from an application software.

4. The system of claim 1, wherein the NPDU comprises an NPDU header, the APDU and an NPDU trailer.

5 5. The system of claim 1, wherein the HCNPDU comprises a home code and the NPDU.

6. The system of claim 1, wherein the data frame unit comprises a frame header, the NPDU or HCNPDU and a frame trailer.

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7. The system of claim 2, wherein the APDU header comprises an APDU length (AL) field, an APDU header length (AHL) field and an application layer option (ALO) field.

15 8. The system of claim 7, wherein the AHL field has at least 3 bytes.

9. The system of claim 4, wherein the NPDU header comprises a start of LnCP packet (SLP) field, a destination address (DA) field, a sender address (SA) field, a packet length (PL) field and a network layer control (NLC) field.

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10. The system of claim 9, wherein the SLP field has 8 bits, the DA field has 16 bits, the SA field has 16 bits, the PL field has 8 bits and the NLC field has 24 bits.

25 11. The system of claim 9, wherein the NPDU header is formed in order of the SLP field, the DA field, the SA field, the PL field and the NLC field.

12. The system of claim 9, wherein the NLC field comprises a service  
priority (SP) field, an NPDU header length (NHL) field, a protocol version (PV) field,  
a network layer packet type (NPT) field, a transmission counter (TC) field and a  
5 packet number (PN) field.

13. The system of claim 12, wherein the SP field has 3 bits, the NHL field  
has 5 bits, the PV field has 8 bits, the NPT field has 4 bits, the TC field has 2 bits  
and the PN field has 2 bits.

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14. The system of claim 12, wherein the NLC field is formed in order of the  
SP field, the NHL field, the PV field, the NPT field, the TC field and the PN field.

15. The system of claim 12, wherein the SP field is set as a first code for  
15 transmitting an urgent message, a second code for transmitting a general data or  
an event message according to an online or offline status change, a third code for  
transmitting a general event message or a notification message for composing a  
network, and a fourth code for transmitting a data by download or upload  
mechanism.

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16. The system of claim 15, wherein the first code is 0, the second code is 1,  
the third code is 2 and the fourth code is 3.

17. The system of either claim 12 or 13, wherein the upper 4 bits of the PV  
25 field form a version field, and the lower 4 bits thereof form a sub-version field.

18. The system of claim 12, wherein the NPT field is set as a first code for a request packet, a second code for a successful response packet, a third code for a failed response packet, a fourth code for a notification packet, and a fifth code for an interface with the home code control sub-layer.

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19. The system of claim 18, wherein the first code is 0, the second code is 4, the third code is 5, the fourth code is 8 and the fifth code is 13 to 15.

20. The system of claim 12, wherein the TC field is set as a first code showing initial transmission, and the first code is set to be increased by a predetermined size upon the retry request.

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21. The system of claim 20, wherein the first code is 0 and the size is 1.

22. The system of claim 12, wherein the PN field is set to be increased by a predetermined size in every new packet transmission, and to maintain a previous value in the same packet retry.

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23. The system of claim 22, wherein the size is 1.

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24. The system of claim 4, wherein the NPDU trailer comprises a cyclic redundancy check (CRC) field for checking an error, and an end of LnCP packet (ELP) field.

25. The system of claim 24, wherein the NPDU trailer is formed in order of the CRC field and the ELP field.

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26. The system of claim 24, wherein the CRC field has 16 bits and the ELP field has 8 bits.

5           27. The system of claim 5, wherein the home code has 4 bytes.

28. The system of claim 1, wherein the protocol is a living network control protocol (LnCP).

10           29. A storage medium for storing a home code control sub-layer protocol data unit (HCNPDU) transmitted in a home network system including an electric device and a network manager communicating with each other through a network based on a predetermined protocol, the HCNPDU comprising a home code and a network layer protocol data unit (NPDU).

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30. The storage medium of claim 29, wherein the NPDU comprises an NPDU header, an application layer protocol data unit (APDU) and an NPDU trailer.

31. The storage medium of claim 30, wherein the APDU comprises an  
20   APDU header and a protocol data unit (PDU).

32. The storage medium of claim 31, wherein the PDU is a message transmitted from an application software.

25           33. The storage medium of claim 31, wherein the APDU header comprises an APDU length (AL) field, an APDU header length (AHL) field and an application

layer option (ALO) field.

34. The storage medium of claim 33, wherein the AHL field has at least 3 bytes.

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35. The storage medium of claim 30, wherein the NPDU header comprises a start of LnCP packet (SLP) field, a destination address (DA) field, a sender address (SA) field, a packet length (PL) field and a network layer control (NLC) field.

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36. The storage medium of claim 35, wherein the SLP field has 8 bits, the DA field has 16 bits, the SA field has 16 bits, the PL field has 8 bits and the NLC field has 24 bits.

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37. The storage medium of claim 35, wherein the NPDU header is formed in order of the SLP field, the DA field, the SA field, the PL field and the NLC field.

38. The storage medium of claim 35, wherein the NLC field comprises a service priority (SP) field, an NPDU header length (NHL) field, a protocol version (PV) field, a network layer packet type (NPT) field, a transmission counter (TC) field and a packet number (PN) field.

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39. The storage medium of claim 38, wherein the SP field has 3 bits, the NHL field has 5 bits, the PV field has 8 bits, the NPT field has 4 bits, the TC field has 2 bits and the PN field has 2 bits.

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40. The storage medium of claim 38, wherein the NLC field is formed in order of the SP field, the NHL field, the PV field, the NPT field, the TC field and the PN field.

5           41. The storage medium of claim 38, wherein the SP field is set as a first code for transmitting an urgent message, a second code for transmitting a general packet or an event message according to an online or offline status change, a third code for transmitting a notification message for composing a network or a general event message, and a fourth code for transmitting a data by download or upload  
10       mechanism.

42. The storage medium of claim 41, wherein the first code is 0, the second code is 1, the third code is 2 and the fourth code is 3.

15           43. The storage medium of either claim 38 or 39, wherein the upper 4 bits of the PV field form a version field, and the lower 4 bits thereof form a sub-version field.

44. The storage medium of claim 38, wherein the NPT field is set as a first  
20       code for a request packet, a second code for a successful response packet, a third code for a failed response packet, a fourth code for a notification packet, and a fifth code for an interface with the home code control sub-layer.

45. The storage medium of claim 44, wherein the first code is 0, the second  
25       code is 4, the third code is 5, the fourth code is 8 and the fifth code is 13 to 15.

46. The storage medium of claim 38, wherein the TC field is set as a first code showing initial transmission, and the first code is set to be increased by a predetermined size upon the retry request.

5           47. The storage medium of claim 46, wherein the first code is 0 and the size is 1.

48. The storage medium of claim 38, wherein the PN field is set to be increased by a predetermined size in every new packet transmission, and to  
10       maintain a previous value in the same packet retry.

49. The storage medium of claim 48, wherein the size is 1.

50. The storage medium of claim 30, wherein the NPDU trailer comprises a  
15       cyclic redundancy check (CRC) field for checking an error, and an end of LnCP packet (ELP) field.

51. The storage medium of claim 50, wherein the NPDU trailer is formed in order of the CRC field and the ELP field.  
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52. The storage medium of claim 50, wherein the CRC field has 16 bits and the ELP field has 8 bits.

53. The storage medium of claim 29, wherein the home code has 4 bytes.  
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54. The storage medium of claim 29, wherein the protocol is a living



network control protocol (LnCP).